

# Species

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# Report of *Sphenophyllum emarginatum* from Barakar Formation, Simlong Open Cast Mine, Rajmahal Basin, Jharkhand, India

Arun Joshi<sup>1,2</sup>

## ABSTRACT

Present study is a report of *Sphenophyllum emarginatum* from the Barakar Formation, Simlong Open Cast Mine, Rajmahal Basin, Jharkhand, India. The study is important as it is the first report of this species from the Simlong Open Cast Mine, which is the most naxalite prone area. Therefore, helps to generate a new palaeobotanical database from the coalmine especially, from the Rajmahal Basin from where the megafossils records are scanty.

**Keywords:** *Sphenophyllum emarginatum*, Barakar Formation, palaeobotanical database

## 1. INTRODUCTION

*Sphenophyllum* is genus of extinct plants which were lived at Late Devonian to Early Triassic period (Batenburg, 1977). It has been reconstructed as a scrambling, leaning, creeping plant which had prominent nodal and intermodal peculiarities in its morphology. Normally, the plants were branched and at nodal plain leaves were arranged in whorl (Galtier & Daviero, 1999). Additionally, there existed condition of heterophylly in the genus. This is the condition in which plant body consist of two or more than two types of leaves. In *Sphenophyllum*, narrow leaflets were on the lower axes, which were helpful in leaning and scrambling whereas, photosynthesis was carried out by the wider leaflets. However, *S. emarginatum* had similar leaflets with blunt ends (Barthel, 1997). Recently, *S. churulianum* (Edirisooriya *et al.*, 2018) is known from Sri Lanka and earlier *Sphenophyllum gondwanensis* from the Rajmahal Basin (Singh *et al.*, 1986). Therefore, present communication will be helpful to widen the scope of this species as one of the taxa to determine biostratigraphy of the Barakar Formation (Artinskian-Kungurian) and thus enhance palaeobotanical database from the area.

## 2. MATERIAL AND METHOD

The sample was collected from the Simlong Open Cast Mine (Fig. 1a & b). The sample collected in the form of carbonaceous shale in which impression of the specimen was found. The diagnosis had been done on the basis of relevant literature (Chandra & Surange, 1979). Morphotaxonomical characters were identified with the help of hand lens and low power binocular microscope (Olympus 20iH). The specimen has been deposited in the Botany Department, SGRR (P.G.) College Dehradun.

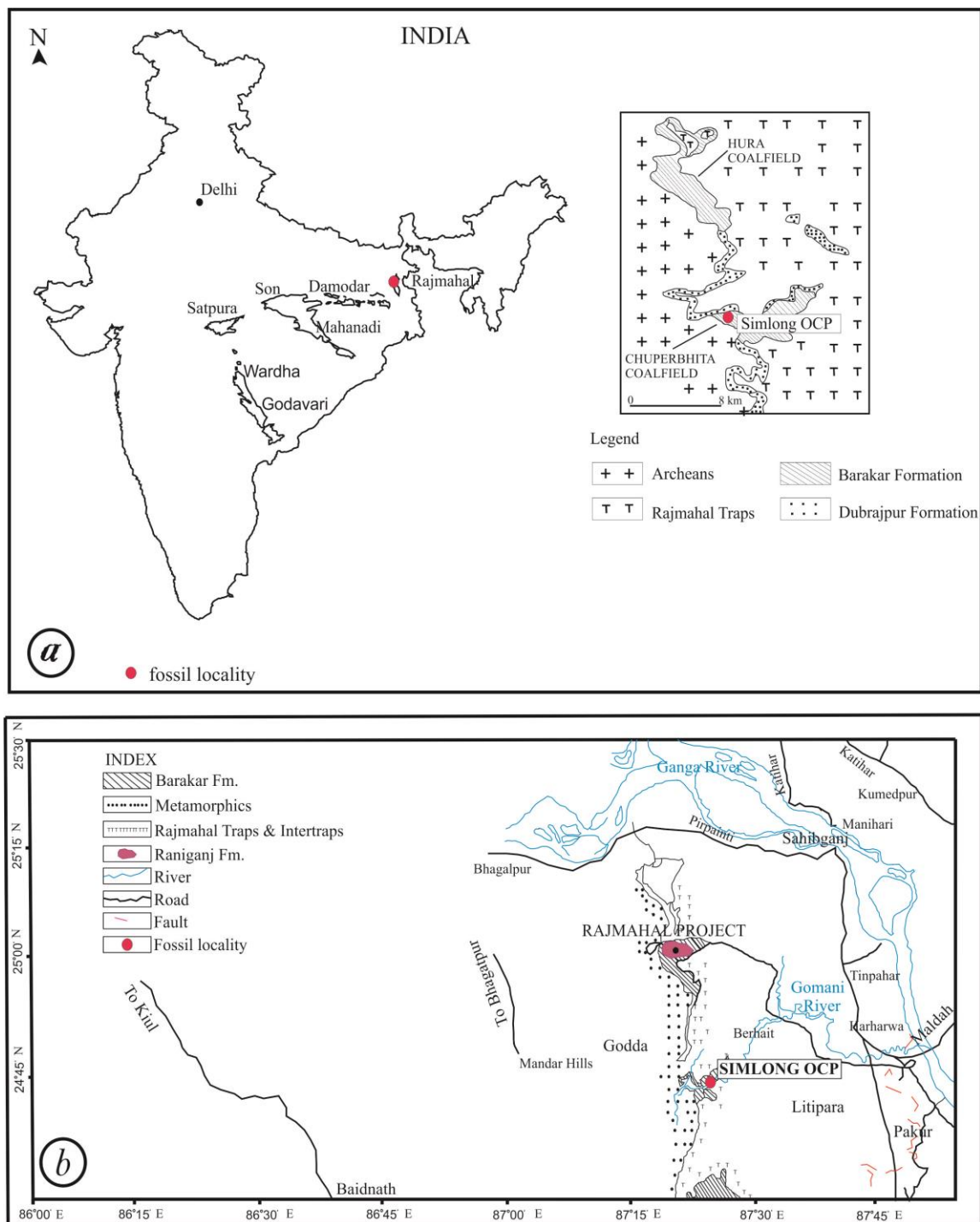
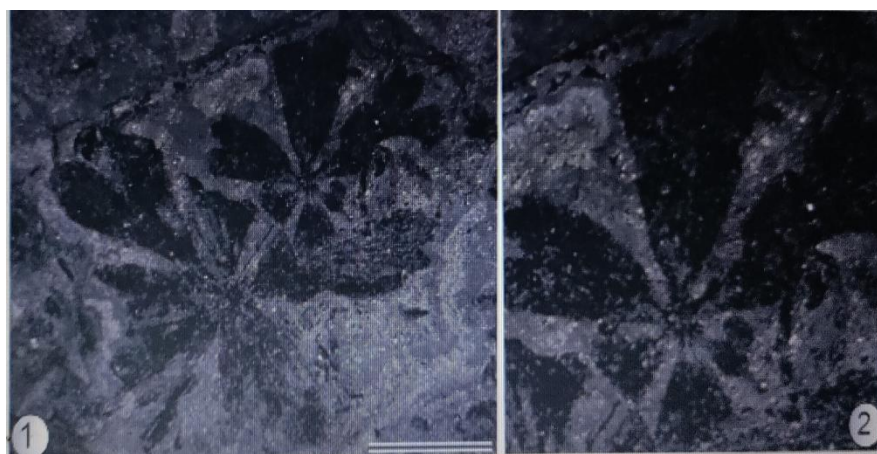


Figure 1. (a) Map showing fossil locality. (b) Geological map of the study area (after ECL, Rajmahal Area).



**Figure 2.** (1). *Sphenophyllum emarginatum*, specimen no. SIM/27/2019, (Scale bar = 1 cm). (2) Enlargement portion of Fig. 1 (x 3) shows blunt end leaflets arranged in whorl at nodal region.

### 3. RESULTS

#### SYSTEMATIC DESCRIPTION

*Sphenophyllum emarginatum* (Brongniart) Koenig, 1825

**Specimen No.** SIM/27/2019 (Fig. 2)

**Locality:** Simlong Open Cast Mine, Godda District, Rajmahal Basin, Jharkhand

**Horizon and Age:** Barakar Formation, Early Permian

**Description:** Only one specimen was collected which is clearly preserved. Slender, striate, segmented axes 0.08-0.12 cm wide, nodal plane expanded which bears radially arranged whorls of six leaves (Fig. 3); internodes 0.6–0.9 cm long. Leaves are 0.5-0.7 cm in length and have blunt ends. Entire lamina has grooved veins of equal distance apart.

**Remarks:** The present species is different from *Sphenophyllum gondwanensis* described by Singh *et al.*, 1986 (Pl. 1, Figs 1-5) and *Sphenophyllum churulianum* by Edirisooriya *et al.*, 2018 (Fig. 2 a, b) in having similar leaves with blunt ends.

### 4. CONCLUSION

Though the specimen is single but it reflects the presence of *Sphenophyllum emarginatum* in the Early Permian sediments of the Simlong Open Cast Mine, Rajmahal Basin, Jharkhand from where the species has not been recovered earlier. Being as a most naxalite prone area discovery of such fossils helps to expand palaeobotanical knowledge from the area (Joshi, 2020; Joshi & Priya, 2021) and thus helpful to maintain a new palaeobotanical database. More studies are needed to expand this knowledge from such locality which is treasure for the fossils and is just inaccessible as it comes under naxalite prone region.

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#### Ethical approval

*Sphenophyllum emarginatum* from the Barakar Formation, Simlong Open Cast Mine, Rajmahal Basin, Jharkhand, India was observed in the study. The ethical guidelines for plants & plant materials are followed in the study for sample collection & identification.

**Conflicts of interests**

The authors declare that there are no conflicts of interests.

**Data and materials availability**

All data associated with this study are present in the paper.

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